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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,596	04/16/2004	Mark Zimmer	119-0035US	1202

61947 7590 01/26/2009

WONG, CABELLO, LUTSCH, RUTHERFORD & BRUCCULERI LLP
20333 SH 249
SUITE 600
HOUSTON, TX 77070

EXAMINER	
THOMAS, MIA M	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
01/26/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,596	ZIMMER, MARK	
	Examiner	Art Unit	
	Mia M. Thomas	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 August 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to applicant's remarks received on 12 August 2008. Claims 1-6 were pending and were finally rejected. These rejections are appealed. Reconsideration of these claims in a Pre-Appeal Brief Conference is requested.

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Response to Arguments

2. Applicant's arguments with respect to claims 1-16, detailed at pages 2-5 of applicant's remarks have been considered but are moot in view of the new ground(s) of rejection. A complete action on the merits follows herewith.

Examiner would like to note that at Claim 14, line 2, the applicant failed to amend the phrase "machine" to the phrase "computer" as was amended in all previous claims. The Examiner will assume for examination purposes that it was the applicant's intent to amend that phrase "machine" to the phrase "computer" at line 2 of Claim 14; the aforementioned amendment to the claims will be assumed for examination purposes.

As best understood by the Examiner 14. (currently amended) The ~~machine~~ computer readable medium of claim 11, wherein the method steps executable by the ~~machine~~ computer further comprise: applying the secondary kernel to each pixel of the second intermediate result

to produce a third intermediate result; and determining a final result by interpolating between the second intermediate result and the third intermediate result.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2, 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regards to the terms "a regular factor" and "a current kernel application step number", the Examiner is unsure as to how to define these limitations from the original claim. Appropriate clarification/correction is required for proper claim interpretation.

With regards to the claimed limitation "an output pixel" at line 2 of Claim 2, the Examiner is unsure if the "output pixel" at line 2 of Claim 1 is the same "output pixel" as detailed at Claim 2, line 2 or if the "output pixel" is a different output pixel at each claim. Appropriate clarification/correction is required for proper claim interpretation.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-10 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example, at claim 1 for instance, an adequate "tie to" an appropriate statutory category would be similar to this example:

> 15. (Original) A method of applying a blur to an image **using a processor (or computer) to perform the steps of:**
> defining a primary kernel to compute an output pixel as a weighted average of a plurality of pixels of the image wherein a spatial relationship between the output pixel and the plurality of pixels is determined by a step size of the primary kernel;
> applying the primary kernel to each pixel of the image to produce an intermediate result;
> increasing the step size of the primary kernel to create a higher order primary kernel and applying the higher order primary kernel to the intermediate result to produce a result image.

The aforementioned example is just a mere suggestion as to how to overcome this rejection. It is important for the applicant and/or applicant's representative to ensure that any and all amendments to the claims and/or specification are indeed SUPPORTED by the original specification.

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).
[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 2, 5-8, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alderson et al. (US 20020159648 A1) in combination with Park et al. (US 6535632 B1).

Regarding Claim 1: (original) Alderson teaches a method of applying a blur to an image ("In another exemplary aspect of the present invention, a method and apparatus for approximating a gaussian-blur filter are provided." at paragraph [0009]) the method comprising the steps of:

defining a primary kernel to compute an output pixel as a weighted average of a plurality of pixels of the image (Refer to Figure 6a, also at paragraph [0051])

applying the primary kernel to each pixel of the image to produce an intermediate result (Refer to Figure 6b, also at paragraph [0080]; "Different kernel sizes can be utilized to perform edge enhancement at the a desired spatial frequency." at paragraph [0051])

increasing the step size of the primary kernel to create a higher order primary kernel and applying the higher order primary kernel to the intermediate result to produce a result image (Refer to Figure 6c; "Cascading the first and second exemplary edge filters

provides the same filtering result as the effective resultant edge filter with a 5x7 kernel illustrated in FIG. 6C." at paragraph [0052]);

Park teaches wherein a spatial relationship between the output pixel the plurality of pixels is determined by a step size of the primary kernel (Refer to column 14, line 44-46; specifically, "According to a 2-dimensional implementation embodiment, a step size along a first axis 114 is derived and a step size along a second axis 116 is derived.")

Alderson and Park are combinable because they are in the same field of image processing with regards to low pass image filters. (See title, abstract and classification of each reference).
At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson and Park. The combination of the teachings of Alderson and Park by known methods with no change in their respective functions would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Further, at the time that the invention was made, it would have been obvious to define a primary kernel to compute an output pixel, wherein the spatial relationship between the output pixels and the plurality of pixels is determined by a step size of the primary kernel. Park teaches an adaptive spatial filter including a plurality of averaging kernels. (See abstract, Park). Park also teaches an appropriate kernel is selected for each pixel. Park further teaches determining a step size at column 15, lines 16-column 16, lines 33. Moreover, Park teaches "Different kernel sizes can be utilized to perform edge enhancement at the desired spatial frequency." at paragraph [0051]).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson and Park to obtain the specified claimed elements of Claim 1.

The motivation/suggestion for doing so would have been "The use of multiple kernels allows for a better approximation of the low frequency removal." at paragraph [0051], Alderson. Further, "The kernel for the hue component is selected by comparing the product of intensity component and the saturation component to the hue component thresholds. A color gradient operation is applied to the filtered HSI data to aid in detecting image object boundaries. Object segmentation and other image processing techniques may be performed on the filtered HSI data." at abstract, Park.

Therefore, it would have been obvious to combine the teachings of Alderson and Park to obtain the specified claimed elements of Claim 1.

Regarding Claim 11: Claim 11 has subject matter that equally resembles the subject matter of Claim 1. Accordingly, Claim 11 is rejected for the same reasons, rationale and motivation as listed above at claim 1.

Specifically, Park teaches a computer-readable medium having embodied thereupon instructions executable by a computer to perform the [above] method steps ("The various subsystems are implemented in software on one or more host computing devices or are integrated into an embedded system. Preferably the functions of the various subsystems are

performed by programmed digital computers of the type which are well known in the art." at column 4, line 59+).

Regarding Claim 2: (original) Alderson teaches defining a secondary kernel to compute an output pixel as a weighted average of a plurality of pixels of the image ("Blurring the input image data can further comprise applying a second edge filter (e.g., second box filter) to the first edge-filtered data to provide second blurred data, multiplying the second blurred data by a second predetermined scale factor, and subtracting the resulting second scaled data from the first edge-filtered data to provide second edge-filtered data reflecting the edge-enhancement." at paragraph [0051])
applying the secondary kernel to each pixel of the result image to produce a second intermediate result ("Different kernel sizes can be utilized to perform edge enhancement at a desired spatial frequency." at paragraph [0051]).

Park teaches wherein a spatial relationship between the output pixel and the plurality of pixels is determined by a step size of the secondary kernel and wherein the weighted average of the secondary kernel is different from the weighted average of the primary kernel (Refer to Figure 12, also at column 16, line 10-33).

Alderson and Park are combinable because they are in the same field of image processing with regards to low pass image filters. (See title, abstract and classification of each reference).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson and Park. The combination of the teachings of

Alderson and Park by known methods with no change in their respective functions would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Further, at the time that the invention was made, it would have been obvious to define a spatial relationship between the output pixel and the plurality of pixels to be determined by a stepsize of the secondary kernel and wherein the weighted average of the secondary kernel is different from the weighted average of the primary kernel. Park teaches an adaptive spatial filter including a plurality of averaging kernels. (See abstract, Park). Park also teaches an appropriate kernel is selected for each pixel. Park further teaches determining a step size at column 15, lines 16-column 16, lines 33. Moreover, Park teaches "Different kernel sizes can be utilized to perform edge enhancement at the desired spatial frequency." at paragraph [0051]). It is clear that Park teaches multiple step sizes for each kernel as applicable to the respective weighted averaging of each application of the blur (as rejected above at claim 1).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson and Park to obtain the specified claimed elements of Claim 2.

The motivation/suggestion for doing so would have been "The use of multiple kernels allows for a better approximation of the low frequency removal." at paragraph [0051], Alderson. Further, "The kernel for the hue component is selected by comparing the product of intensity component and the saturation component to the hue component thresholds. A color gradient operation is applied to the filtered HSI data to aid in detecting image object boundaries. Object

segmentation and other image processing techniques may be performed on the filtered HSI data." at abstract, Park.

Regarding Claim 12: Claim 12 has subject matter that equally resembles the subject matter of Claim 2. Accordingly, Claim 12 is rejected for the same reasons, rationale and motivation as listed above at claim 2.

Regarding Claim 5:(original) Alderson teaches the step size is further increased to create a successively higher order primary kernel and the successively higher order primary kernel is applied to a previous intermediate result to produce a next intermediate result until a predetermined step size limit is reached (Refer to column 15, lines 56-67; "Such cut-off value may vary for differing embodiment, but preferably is less than a threshold value which identifies an estimated match between a window and the template.")

Regarding Claim 6: (original) Alderson teaches the blur is a Gaussian blur computed by performing each step in a horizontal direction and in a vertical direction ("a method and apparatus for approximating a Gaussian-blur filter are provided." at paragraph [0009].

Regarding Claim 7:(original) Herf teaches the blur is a blur selected from the group consisting of: a motion blur, a zoom blur, a radial blur, and a spatially dependent blur ("The generalized image blurring method 200 may be used to carry out various types of image blurs known in the art. For example, the method may be used to carry out a motion blur, a Box blur, a Gaussian blur, a Spin blur, and a Zoom blur, each of which will now be described separately." at column 4, line 1).

Regarding Claim 8 (original): Herf teaches wherein the steps are performed by a plurality of GPU fragment programs ("The graphics hardware device 108 may be any one of numerous devices known in the art including, but not limited to, the GeForce family of video hardware available from NVIDIA Corporation, the Radeon family of video hardware available from ATI Corporation, and a variety of graphics hardware available from Matrox, 3Dlabs, and SGI." at column 3, line 8).

8. Claim 3, 4, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alderson et al.(US 20020159648 A1) in combination with Park et al. (US 6535632 B1) and further in view of Herf (US 6,925,210 B2).

Regarding Claim3: (original) Alderson and Park in combination teach all the claimed elements as rejected above. Alderson and Park in combination does not expressly teach interpolation.

Herf teaches determining a final result by interpolating between the result image and the second intermediate result (Following the flowchart of Figure 5, Figure 5, numeral 530 teaches the "generated final blurred image"; At Figure 5, numeral 501 through numeral 531, the process for determining a final result (Fig.5, numeral 530) by interpolation (Fig.5, numeral 510) between the result image and the second intermediate result (numeral 510) is described herein; "Figure 5 is a flowchart depicting the generalized image blurring method of Figure 2..." at column 2, line 49).

Alderson in combination with Park and Herf are combinable because they are in the same field of image processing, specifically blurring algorithms (low-pass filtering) (See title and abstract of each invention).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to combine the teaching of Herf with the combination of the teachings of Alderson and Park.

The motivation/suggestion for doing so would have been to decrease processing times and increase memory accessibility. Specifically," large blurs are too expensive to be implemented directly using accumulation buffer techniques" (Herf). When the user is allowed to transform the intermediate results the blurring method is more efficiently used throughout."

Regarding Claim 13 (currently amended): Claim 13 has subject matter that equally resembles the subject matter of Claim 3. Accordingly, Claim 13 is rejected for the same reasons as listed at Claim 3.

Regarding Claim 4 (original): Herf teaches applying the secondary kernel to each pixel of the second intermediate result to produce a third intermediate result; and determining a final result by interpolating between the second intermediate result and the third intermediate result. ("The image blurring method described above takes advantage of the ability of graphics hardware to do recursive rendering, and exploits this recursive rendering capability in a novel way to blur images in real-time, without a great deal of computational precision." at column 7, line 19).

Regarding Claim 14 (currently amended): Claim 14 has subject matter that equally resembles the subject matter of claim 4. Claim 14 is rejected for the same reasons as listed at Claim 4.

9. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alderson et al.(US 20020159648 A1) in combination with Park et al. (US 6535632 B1) and further in view of Curry et al. (US 20040051909 A1).

Regarding Claim 9 (As best understood by the Examiner-Original): Alderson and Park in combination teach all the claimed elements as rejected above. Alderson and Park in combination does not expressly teach the step size is computed proportional to a regular factor raised to a power determined by a current kernel application step number.

Curry teaches the step size is computed proportional to a regular factor raised to a power determined by a current kernel application step number ("The input signals are up-sampled by a factor of 32 in each direction to restore it to the original resolution. Each interpolation unit is performing bilinear interpolation, essentially generating 32*32=1024 pixels for each original pixel. The step size of the bilinear interpolation is [fraction (1/32)](nd) of the original pixel grid. The following paragraphs describe in more details the Single and Dual Interpolation Units." at paragraph [0055].

Alderson, Park and Curry are combinable because they are in the same field of image processing, specifically blurring algorithms (low-pass filtering) (See title and abstract of each invention).

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination of Alderson, Park and Curry would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a computational proportion to define a step size based on a regular factor raised to a power determined by a current kernel application step number.

The suggestion/motivation for doing so would have been to create "an efficient method and system for eliminating halftone screens from scanned documents while preserving the quality and sharpness of text and line-art is disclosed." at paragraph [0008], Curry.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson, Park and Curry to obtain the specified claimed elements of Claim 9.

Regarding Claim 15 (currently amended): Claim 15 has subject matter that equally resembles the subject matter of claim 9. Claim 15 is rejected for the same reasons as listed at Claim 9.

10. Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alderson et al.(US 20020159648 A1) in combination with Park et al. (US 6535632 B1) and further in view of Wal (US 20030113031 A1).

Regarding Claim 10:(original) Alderson and Park in combination teach all the claimed elements as rejected above. Alderson and Park in combination does not expressly teach the step size is horizontal in even subpasses and vertical in odd subpasses.

Wal teaches the step size is horizontal in even subpasses and vertical in odd subpasses (Refer to paragraph [0036]; "Filter unit 10 may be a two-dimensional filter having a separable kernel that can be treated as a combination of separate horizontal and vertical filters. The five vertical and five horizontal filter coefficients of the exemplary filter unit 10 are programmable within a limited set of values and may be either symmetric or antisymmetric. In addition, the filter unit 10 may be configured to have either an odd or an even number of taps.")

Alderson, Park and Wal are combinable because they are in the same field of image processing, specifically blurring algorithms (low-pass filtering) (See title and abstract of each invention).

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination of Alderson, Park and Wal would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize function such that the step size is horizontal in even subpasses and vertical in odd subpasses.

The suggestion/motivation for doing so would have been to create a device such that "Each line store memory may be programmed to provide data to, or receive data from one of the PPP components by a controller and to transfer the data from or to the memory, respectively. Access to the external memory by the line store memories is controlled by an arbitration processor which implements a priority scheme." at abstract, Wal.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Alderson, Park and Wal to obtain the specified claimed elements of Claim 10.

Regarding Claim 16 (currently amended): Claim 16 has subject matter that equally resembles the subject matter of claim 10. Claim 16 is rejected for the same reasons as listed at Claim 10.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is (571)270-1583. The examiner can normally be reached on Monday-Thursday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mia M Thomas/
Examiner, Art Unit 2624

/Vikkram Bali/
Supervisory Patent Examiner, Art Unit 2624